PROPOSED

Temporary Covered Source Permit (CSP) No. 0660-01-CT Review
Application No. 0660-02

APPLICANT:	Goodfellow Brothers, Inc.
RESPONSIBLE OFFICIAL:/POC	Ms. Amy Sands Crusher Administrator (808) 839-7202
INITIAL LOCATION	UTM Coordinates (Zone 4) 592,384 Meters East 2,358,002 Meters North Campbell Industrial Park Kapolei, HI 966707
MAILING ADDRESS	P.O. Box 220 Kihei, HI 96753
CONSULTANT	J.W. Morrow 1481 South King Street, Suite 548 Honolulu, HI 96814 (808) 942-9096
SIC	1429

PROPOSED PROJECT:

The subject application is for a modification to a temporary covered source permit. The application seeks to add a 400 ton per hour (tph) portable jaw crusher with 300 horsepower (hp) diesel engine to the existing permit. The current permit allows for the operation of a 265 tph portable jaw crusher powered by a 192 hp diesel engine. The equipment is fueled with fuel oil no. 2 with a sulfur content of fifteen (15) parts per million (ppm). The applicant has proposed an operational limit of 2,080 hours per rolling twelve-month (12-month) period for each mobile crusher. In addition, the crushers will not operate simultaneously at the same location. The Standard Industrial Classification Code (SICC) for this facility is 1429 - Crushed and Broken Stone, Not Elsewhere Classified.

Existing Equipment Description:

1. 265 tph Komatsu Jaw Crusher Model BR 380 JG-1, s/n 1381 with 192 hp Komatsu diesel engine Model SAA6D125E-2, s/n 26394576 fired with diesel fuel No. 2, 9.9 gallons per hour.

Equipment to be added:

- 400 tph Nordberg LT-105 Mobile Jaw Crusher with 300 hp Caterpillar diesel engine Model C9, fired with diesel fuel no. 2, 15 gallons per hour.

Air Pollution Controls:

Air pollution control for each portable jaw crusher consists of a water spray nozzle located at the main conveyor belt. Therefore, a control efficiency of 70% will be credited to the emission points after the material has been crushed.

APPLICABLE REQUIREMENTS:

Hawaii Administrative Rules (HAR) Title 11 Chapter 59
Hawaii Administrative Rules (HAR) Title 11 Chapter 60.1
- Subchapter 1 - General Requirements
- Subchapter 2 - General Prohibitions
  - 11-60.1-31 Applicability
  - 11-60.1-32 Visible Emissions
  - 11-60.1-33 Fugitive Dust
  - 11-60.1-38 Sulfur Oxides from Fuel Combustion
- Subchapter 5 - Covered Sources
- Subchapter 6 - Fees for Covered Sources,
  - 11-60.1-111 Definitions
  - 11-60.1-112 General fee provisions for covered sources
  - 11-60.1-113 Application fees for covered sources
  - 11-60.1-114 Annual fees for covered sources
  - 11-60.1-115 Basis of annual fees for covered sources
- Subchapter 8 - Standards of Performance for Stationary Sources
  - 11-60.1-161 New Source Performance Standards
- Subchapter 10 - Field Citations

FEDERAL REQUIREMENTS

40 Code of Federal Regulations (CFR) Part 60 Subpart OOO - *Standards of Performance for Nonmetallic Mineral Processing Plants* is applicable to both mobile crushing units since the manufacture date of the each mobile crushing unit is after August 1983 and each mobile crushing unit has a maximum capacity greater than 150 TPH. The standard includes stricter visible emissions requirements and annual source testing to verify compliance with the stricter requirements.

The diesel engine for each mobile crusher is subject to the following Federal regulations:

- 40 CFR Part 60, Standards of Performance for New Stationary Sources, Subpart A, *General Provisions*;
- 40 CFR, Part 60 Standards of Performance for New Stationary Sources, Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*;
- 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Source Categories, Subpart A - *General Provisions*; and
- 40 CFR Part 63, National Emission Standards For Hazardous Air Pollutants For Source Categories, Subpart ZZZZ - *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*

40 CFR 63, Subpart ZZZZ is an applicable requirement for the diesel engine generator because it is a new or reconstructed stationary reciprocating internal combustion engine (RICE) located at an area source of HAPs. However, pursuant to §63.6590(c)(1), a new or reconstructed stationary RICE located at an area source will satisfy the requirements of this subpart by meeting the requirements of 40 CFR subpart IIII for compression ignition engines. No further requirements for such engines are required by 40 CFR 63, Subpart ZZZZ.

Since 40 CFR 60, Subpart IIII is an applicable requirement for the black-start diesel engine generator pursuant to 40 CFR 63, Subpart ZZZZ, §63.6590, the applicable requirements are as follows:

Pursuant to §60.4204(a), "Owners and operators of pre-2007 model year non-emergency stationary compression-ignition internal combustion engine (CI ICE) with a displacement of less than 10 liters per cylinder must comply with the emission standards in table 1 of this subpart. The portion of table 1 that applies to the subject DEG is:

TABLE 1 TO SUBPART IIII OF PART 60.—EMISSION STANDARDS FOR STATIONARY PRE-2007 MODEL YEAR ENGINES WITH A DISPLACEMENT OF <10 LITERS PER CYLINDER

[As stated in §§ 60.4204(a), you must comply with the following emission standards]

Maximum engine power	Emission standards for stationary pre-2007 model year engines with a displacement of <10 liters per cylinder in g/kW-hr (g/hp-hr)				
	NMHC + NOX	HC	NOX	CO	PM
225<KW<450 (300≤HP>600)	N/A	1.3 (1.0)	9.2 (6.9)	11.4 (8.5)	0.54 (0.40)

Pursuant to §60.4207(b), beginning October 1, 2010, owners and operators of stationary CI ICE subject to this subpart with a displacement of 30 liters per cylinder that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.5(b) for nonroad diesel fuel.

(**§ 80.510 What are the standards and marker requirements for NRLM [nonroad locomotive or marine] diesel fuel?**

(b) Beginning June 1, 2010. Except as otherwise specifically provided in CFR 80, Subpart I, all NR and LM diesel fuel is subject to the following per-gallon standards:

(1) Sulfur content.

(i) 15 ppm maximum for NR diesel fuel.

(ii) 500 ppm maximum for LM diesel fuel.

(2) Cetane index or aromatic content, as follows:

(i) A minimum cetane index of 40; or

(ii) A maximum aromatic content of 35 volume percent.)

Due to the new fuel standards, a permit condition will be added requiring the DEG to use fuel with a maximum sulfur content of 15 parts per million (ppm).

Pursuant to §60.4209, if you are an owner or operator of a stationary CI internal combustion engine, you must meet the monitoring requirements of this section and also meet the monitoring requirements specified in §60.4211.

The monitoring requirements specified in §60.4211 are:

Sec. 60.4211 What are my compliance requirements if I am an owner or operator of a stationary CI internal combustion engine?

(a) If you are an owner or operator and must comply with the emission standards specified in this subpart, you must operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer. In addition, owners and operators may only change those settings that are permitted by the manufacturer. You must also meet the requirements of 40 CFR parts 89, 94, and/or 1068, as they apply to you.

(b) If you are an owner or operator of a pre-2007 model year stationary CI internal combustion engine and must comply with the emission standards specified in Sec. Sec. 60.4204(a), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) through (5) of this section.

(1) Purchasing an engine certified according to 40 CFR Part 89 or 40 CFR Part 94, as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.
(2) Keeping records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in this subpart and these methods must have been followed correctly.
(3) Keeping records of engine manufacturer data indicating compliance with the standards.
(4) Keeping records of control device vendor data indicating compliance with the standards.
(5) Conducting an initial performance test to demonstrate compliance with the emission standards according to the requirements specified in Sec. 60.4212, as applicable.

To demonstrate compliance, engine manufacturer data was provided by applicant. The data provided demonstrates compliance with the applicable standards. Refer to permit application for documentation of manufacturer engine test data.

Sec. 60.4214 What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary CI internal combustion engine?

(a) Owners and operators of non-emergency stationary CI ICE that are greater than 2,237 KW (3,000 HP), or have a displacement of greater than or equal to 10 liters per cylinder, or are pre-2007 model year engines that are greater than 130 KW (175 HP) and not certified, must meet the requirements of paragraphs (a)(1) and (2) of this section.

(1) Submit an initial notification as required in Sec. 60.7(a)(1). The notification must include the information in paragraphs (a)(1)(i) through (v) of this section.

(i) Name and address of the owner or operator;
(ii) The address of the affected source;
(iii) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
(iv) Emission control equipment; and
(v) Fuel used.

(2) Keep records of the information in paragraphs (a)(2)(i) through (iv) of this section.

(i) All notifications submitted to comply with this subpart and all documentation supporting any notification.
(ii) Maintenance conducted on the engine.
(iii) If the stationary CI internal combustion is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards.
(iv) If the stationary CI internal combustion is not a certified engine, documentation that the engine meets the emission standards.

The requirements of §60.4214 will be incorporated into the permit in Section D, Monitoring and Recordkeeping Requirements.

Best Available Control Technology (BACT)

A BACT analysis is required for new sources or modifications to existing sources that would result in a net significant emissions increase as defined in HAR, Section 11-60.1-1. The emissions from the addition of the additional mobile crusher are less than significant levels. Therefore, a BACT analysis is not required for this permit. Refer to table 1 for additional details.

~~is the initial permit This is an existing source with a significant increase in PM emissions. Therefore, a BACT analysis is required (see **Table 2**). The applicant proposed to use water sprays to control fugitive dust. Water sprays are considered BACT for other sources that have similar activities, thus water sprays are an acceptable method of BACT.~~

NON-APPLICABLE REQUIREMENTS:

40 CFR Part 61 - National Emission Standard for Hazardous Air Pollutants (NESHAPS) is not an applicable requirement because it does not emit hazardous air pollutants in excess of the 25 TPY total HAP or 10 TPY individual HAP major source triggering levels.

Prevention of Significant Deterioration (PSD):
PSD is not an applicable requirement because the facility is not a major stationary source of air pollution (criteria air pollutant ≥ 100 TPY for listed sources or ≥ 250 TPY for all other sources), with the exception of CO_2. CO_2 emissions are addressed pursuant to the Greenhouse Gas Tailoring Rule.

Greenhouse Gas Tailoring Rule (GGTR):
Due to the fact the greenhouse gas emissions is now classified as a regulated pollutant, the GGTR was promulgated. The GGTR "tailors" the applicability threshold for PSD and Title V permit programs to:

- ≥ 100,000 tons/yr of potential CO_2e emissions for the PSD/Title V Major Source level, and
- ≥ 75,000 tons/yr of potential CO_2e emissions for the PSD/Title V significance level.

The CO_2e emissions from the facility are less than the triggering level and are summarized in the following table:

Pollutant	CO2e (MTPY)	CO2e (TPY)
CO_2	528.61	582.70
CH4	0.45	0.50
N2O	1.33	1.47
Total	530.39	584.66

Compliance Assurance Monitoring (CAM) is to provide a reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 CFR Part 64, for CAM to be applicable, the emissions unit must: (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential pre-control emissions that are greater than the major source level [>100 tpy]; and (5) not otherwise be exempt from CAM. CAM is not applicable to the facility because it is not a major source.

Consolidated Emissions Reporting Rule (CERR) is not applicable because emissions from the facility are less than reporting levels pursuant to 40 CFR 51, Subpart A (see **Table 1**).

Table 1 – CERR & BACT Comparison

Pollutant	Facility Emissions (tpy)	Continuous Emissions (tpy)[a]	CERR Triggering Levels (tpy)		BACT Significant Levels (tpy)
			1-yr Reporting Cycle (Type A Sources)	3-yr Reporting Cycle (Type B Sources)	
VOC	0.23	0.99	≥ 250	≥ 100	≥40
PM_{10}	10.72	45.14	≥ 250	≥ 100	≥15
NO_x	5.53	23.29	≥ 2,500	≥ 100	≥40
SO_x	0.73	3.07	≥ 2,500	≥ 100	≥40
CO	0.85	3.60	≥ 2,500	≥ 1,000	≥100
HAPs (total)	0.11	0.46	n/a	n/a	≥5

[a] Emissions @ 8,760 hours per year.

Synthetic Minor Applicability
The facility is not a synthetic minor source because the facility does not exceed the 100 ton per year major source threshold for all pollutants other than CO_2 if operated continuously (8,760 hr/yr) at maximum capacity. Refer to table 1 for continuous emission estimates.

Insignificant Activities/Exemptions:
Insignificant activities listed in the application consist of one (1) diesel fuel tank with a 105.7 gallon capacity.

Alternative Operating Scenarios:
The permit contains an alternate operating scenario for the replacement of the diesel engine, subject to the following conditions:

1. The permittee may replace the 192 HP diesel engine with a temporary diesel engine if repair work reasonably warrants removal (i.e., equipment failure, engine overhaul, or any other major problems requiring maintenance of the engine for efficient operation) of the diesel engine, provided the following provisions are adhered to:

    a. A written request is submitted and approved by the Department of Health prior to exchanging the 192 HP diesel engine with a temporary replacement engine.
    b. The temporary replacement engine has equal or lower emissions with similar stack parameters.
    c. The temporary replacement engine complies with all applicable conditions required for the existing equipments including all operating restrictions and emission limits.
    d. Written notification for returning the original engine to service is submitted to the Department of Health.
    e. The diesel engine shall be repaired and returned to service in a timely manner.

Project Emissions:
Emissions from the two mobile crushing units were determined using AP-42 emission factors. The AP-42 sections used included:

- §1.19.2, Crushed Stone Processing (8/04)
- §13.2.4, Aggregate handling and Storage Piles (11/06)
- §13.2.2, Unpaved Road (11/06)
- §3.3, Gasoline and Diesel Industrial Engines (10/96)

Criteria pollutant emission factors and fuel consumption data were provided by the manufacturer. A summary of the emissions from the permitted equipment is shown in the following table.

Pollutant	EMISSIONS			
	(lb/hr)	(g/s)	Max (TPY)	Limited (TPY)
SO2				
Existing DEG	0.6973	0.088	3.05	0.73
New DEG	0.00315	3.97E-04	0.01	3.28E-03
TOTAL SO2	***0.70045***	***0.088***	***3.07***	***0.73***
NO2				
Existing DEG	1.367	0.172	5.99	1.42
New DEG	3.95	0.172	17.30	4.11
TOTAL NO2	***5.317***	***0.344***	***23.29***	***5.53***
CO				
Existing DEG	0.192	0.024	0.84	0.20
New DEG	0.63	0.079	2.76	0.66
TOTAL CO	***0.822***	***0.104***	***3.60***	***0.85***
VOC				
Existing DEG	0.075	0.009	0.33	0.08
New DEG	0.15	0.019	0.66	0.16
TOTAL VOC	***0.225***	***0.028***	***0.99***	***0.23***
PM10				
Existing DEG	0.068	0.009	0.30	0.07
New DEG	0.06	0.008	0.26	0.06
Existing Crusher	1.4628	0.184	6.41	1.52
New Crusher	2.21	0.278	2.30	9.67
Unpaved roads(existing)	4.59	0.578	20.09	4.77
Unpaved roads(new)	6.92	0.872	30.32	7.20
TOTAL PM10	***15.31***	***1.93***	***59.68***	***23.30***

HAP emissions are:

Operational limit	2080	hours/yr
Max heat input, existing	1.39	MMBtu/hr
Max heat input, new	2.10	MMBtu/hr
Total heat input, all	3.49	MMBtu/hr

HAP	Emission Factor (lb/MMBtu)	EMISSIONS (lb/hr)	(g/s)	Max (TPY)	Limited (TPY)
Aldehydes	7.00E-02	2.44E-01	3.07E-02	1.07E+00	2.54E-01
BENZENE	9.33E-04	3.25E-03	4.10E-04	1.42E-02	3.38E-03
TOLUENE	4.09E-04	1.43E-03	1.80E-04	6.24E-03	1.48E-03
XYLENES	2.85E-04	9.94E-04	1.25E-04	4.35E-03	1.03E-03
PROPYLENE	2.58E-03	8.99E-03	1.13E-03	3.94E-02	9.35E-03

1,3-BUTADIENE	3.91E-05	1.36E-04	1.72E-05	5.97E-04	1.42E-04
FORMALDEHYDE	1.18E-03	4.11E-03	5.18E-04	1.80E-02	4.28E-03
ACETALDEHYDE	7.67E-04	2.67E-03	3.37E-04	1.17E-02	2.78E-03
ACROLEIN	9.25E-05	3.22E-04	4.06E-05	1.41E-03	3.35E-04
Total PAH	1.68E-04	5.86E-04	7.38E-05	2.57E-03	6.09E-04
			TOTAL	**1.17**	**0.28**

For detailed calculations, refer to the attached emissions spreadsheets.

~~poor backg the able to be that were calculated by the consultant could not be deciphered. Therefore, the Department of Health (DOH) used the existing calculations from the previous permit reviews (for the mobile crusher and power screen). The DOH then calculated potential emissions for the added cone crusher. Manufacturer's data was used when available for the diesel engine. All other emission factors were taken from current AP-42 emission factors for the diesel engine, stone processing, and handling/storage piles.~~

~~Emissions from unpaved roads were not calculated since the processed material will be used on site (not imported or exported). The DOH's policy is to not include fugitive emissions from unpaved roads if the trucks are owned by another business. In **Table 2**, the maximum potential annual emissions for the facility, as permitted, were calculated using the proposed limitations with controls (2,080 hrs/yr for each equipment).~~

~~For detailed emission factors, hourly emission rates, and calculations see permit reviews for application nos. 0607-01 and 0602-01 for the existing mobile crusher and power screen respectively, and **ENCLOSURES 1** and **2** for the cone crusher~~

~~**Table 2 – Potential Facility Emissions**~~

~~Note:~~

~~1.The emissions were based on each equipment operating 2,080 hr/yr at maximum capacity.~~
~~2.The Existing 0602-01-NT fugitive emissions include the power screen only and were prorated from its previous 2,000 hr/yr limited. The mobile crusher and DEG were sold to another business.~~
~~3.All fugitive emissions include controlled emission factors (as mentioned previously) for water sprays.~~
~~4.The Total 8,760 hr/yr emissions were prorated from the Total w/ Limits.~~

Air Quality Assessment:

To demonstrate the impact of the new mobile crusher and diesel engine addition on ambient air quality, an ambient air quality analysis was performed. The applicant used the EPA-approved AERMOD program to predict maximum impacts. The existing mobile crusher was not modeled with the new crusher because the crushers are not allowed to operate simultaneously at the same project location. New crusher emissions are fugitive in nature and are not included in the model. The following stack parameters were used in the modeling program for the diesel engine:

Air Modeling Source Parameters							
Source ID	Location			Stack Parameters			
	Elevation (m)	East (m)	North (m)	Height (m)	Temperature (K)	Diameter (m)	Exit Velocity (m/sec)
K149	25	598,358	2,360,966	6.4	696	0.152	47.79

The emission rates used in the model are:

AERMOD Emission Rate Parameters (g/s)					
Source	SO_2	NO_x	CO	PM_{10}	$PM_{2.5}$
K149	0.000397	0.498	0.079	0.00756	0.0068

The modeling for CO, PM_{10} and $PM_{2.5}$ used 2009 data for both surface air data (Honolulu Airport) and upper air station data (Lihue Airport). The modeling for NO_x and SO_2 utilized five (5) years (2005-2009) of surface air data (Honolulu Airport) and upper air station data (Lihue Airport). A total of 1,225 receptors were located at thirty (30) meter spacing. The ozone-limiting method was also used in determining hourly NO_x concentrations.

The air impacts as predicted by AERMOD are:

AMBIENT AIR QUALITY IMPACT ANALYSIS

Pollutant	Averaging Period	Units	CONCENTRATION, µg/m³				% of std.
			Conc.	Background [b]	Total	Std[2]	
NO_x	1-hr	µg/m³	115.97	48.88	164.85	188	
		ppb	61.70	26.00	87.70	100.00	87.70%
	Annual	µg/m³	25.5	8	33.5	70	
		ppb	13.56	4.26	17.82	37.23	47.86%
SO_2	1-hr	µg/m³	0.10	44.37	44.47	195.75	
		ppb	0.04	17	17.04	75000	0.02%
	3-Hour	µg/m³	0.1	26	26.1	1,300	
		ppb	3.83E-02	9.96	10.00	498.08	2.01%
	24-Hour	µg/m³	0.08	8	8.08	365	
		ppm	3.07E-02	3.07	3.10	139.85	2.21%
	Annual	µg/m³	0.02	3	3.02	80	
		ppb	7.66E-03	1.15	1.16	30.65	3.78%
PM_{10}[a]	24-Hour	µg/m³	1.52	37	38.52	150	25.68%
	Annual	µg/m³	0.39	16	16.39	50	32.78%
PM_{25}	24-Hour	µg/m³	1.3	13	14.3	65	22.00%
	Annual	µg/m³	0.35	5.5	5.85	15	39.00%
CO	1-hour	µg/m³	25	4,233	4,258.00	10,000	
		ppb	21.83	3,696.94	3,718.78	8,733.62	42.58%
	8-hour	µg/m³	19.8	1,373.00	1,392.80	5,000.00	
		ppb	17.29	1,199.13	1,216.42	4,366.81	27.86%

[a] assumes all particulate is PM_{10}

[b] NO_x background levels obtained from Kapolei monitoring station, 2008. The remaining background levels obtained from the Honolulu monitoring station, 2008.

Other Issues:
None

Significant New Permit Conditions:
1. A condition has been added to the permit that restricts the use of more than one (1) mobile crusher at the same location.

Conclusion and Recommendation:
The facility is in compliance with State and Federal laws, rules, regulations, and standards with regards to air pollution. Recommend issuance of temporary covered source permit modification.

Kevin Kihara
January 3, 2012